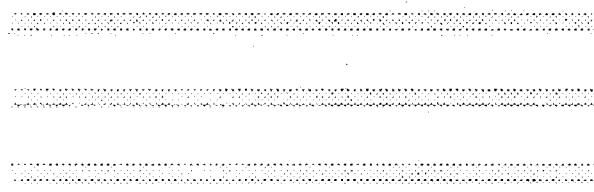
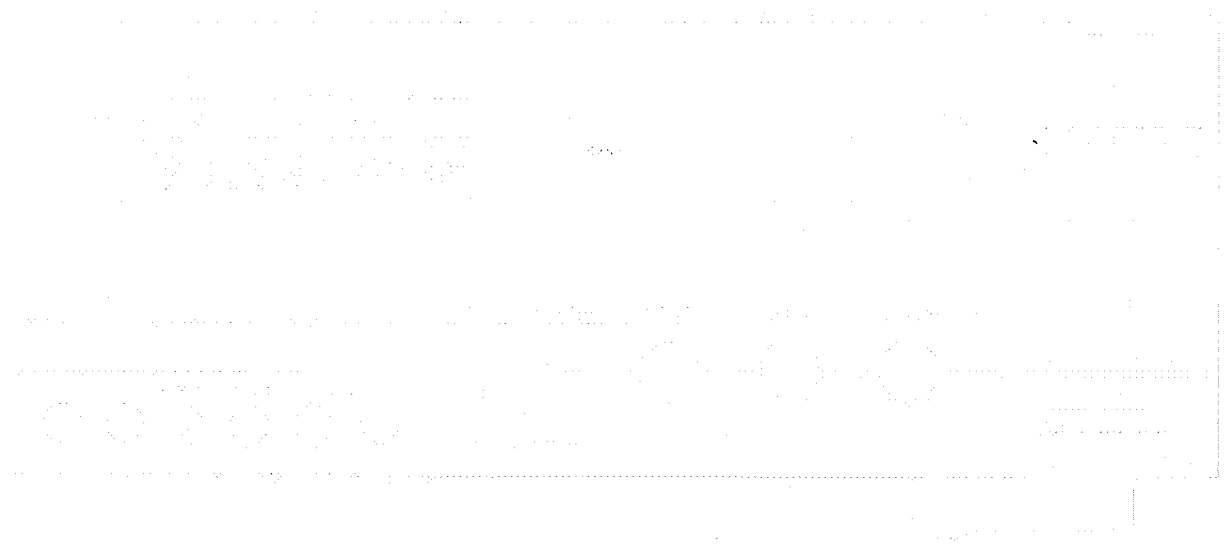


TD420



harman/kardon

CD Transcription Quality Cassette Deck

OWNER'S MANUAL



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION: TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION: POUR EVITER LES CHOCS ELECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE

Power Supply

Plug this cassette deck only into domestic 120 Volt AC outlets. Connecting it to an outlet supplying a higher voltage may create a fire hazard.

Handle the Power Cord Gently

- To disconnect the plug from the AC outlet, pull on the plug itself, not on the cord. Pulling the cord may break the wire.

Harman Kardon TD420

Date of purchase _____

Purchased from _____

Address of business purchased from _____

Installed by _____

Date installation _____

Serial No. _____

- Disconnect the plug from the AC outlet whenever the unit is to be left unused for an extended period of time.
- Do not place furniture or other heavy objects on the cord, and avoid dropping heavy objects on it. Also do not make a knot in the cord; this can damage it and cause a fire hazard.

Place of Installation

Place the cassette deck on a firm and level surface. Avoid installing it:

- In moist or humid places;
- Close to heating equipment or in places exposed to direct sunlight;

- In a direct draft from an air conditioner or in other very cold locations;
- In places subject to excessive vibration or dust;
- In poorly ventilated places;

Moving the Unit

Before moving the unit, be sure to unplug the power cord and disconnect all wires to other stereo components.

Do Not Open the Cabinet

Except for performing routine maintenance (see page 8), do not attempt to service this unit. Tampering with internal components can cause fire or shock, and may void your guarantee.

General Instructions

If water or small objects enter the unit, unplug the power cord immediately and consult an authorized Harman Kardon service center. Using the unit under such conditions may cause a fire or shock hazard.

Cleaning

Remove dust by wiping the unit with a soft, dry cloth. If necessary, use a soft cloth lightly dampened with mild soapy water; then wipe with a dry cloth. Never use benzine, thinner, alcohol or other volatile agents, and avoid spraying insecticides near the unit.

Thank you for choosing a Harman Kardon cassette deck.

And congratulations. Your new unit is an exceptionally well-engineered product that will give you years of superb performance.

The special features of this cassette deck include:

■ CD Transcription Quality

The TD420 has been engineered for wide, flat frequency response, low noise, and low distortion, so as to produce high fidelity recordings from compact discs and other high-quality sound sources.

■ Discrete circuitry

For maximum design flexibility and highest possible performance, Harman Kardon designs a playback circuitry using discrete electronic components, not off-the-shelf integrated circuits.

■ Large Fluorescent Display

Function settings and signal levels are indicated in bright, clear alphanumerics and easy-to-read format.

■ Advanced Ergonomic Design

Controls are engineered and positioned for simple, error-free recording and playback.

■ Music Search

Skip Forward and Reverse buttons rapidly locate the start of any desired segment on a pre-recorded tape.

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■ Dolby HX Pro

Special recording circuitry automatically monitors signal levels and adjusts bias in the presence of momentary high frequency peaks. This allows you to record at higher input levels (for better signal quality) without distortion. Dolby HX Pro operates automatically whenever recordings are made, and the resulting higher-fidelity tape can be played back on any cassette deck.

To get the most from your new cassette deck, please read this manual carefully and follow its instructions. Save the manual for future reference.

Dolby noise reduction and HX Pro headroom extension manufactured under license from

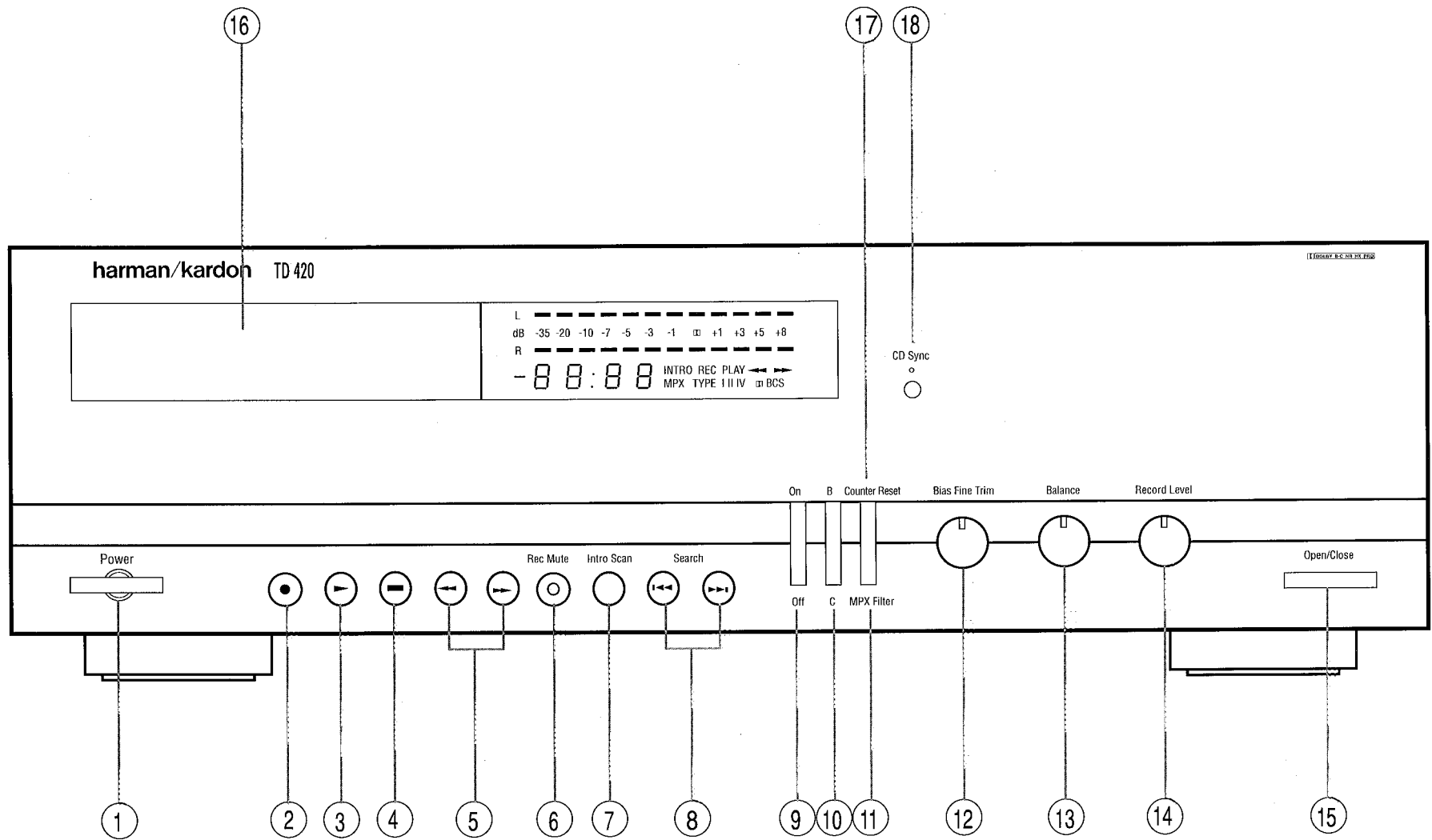
Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.

"Dolby", the double-D symbol  and "HX Pro" are trademarks of Dolby Laboratories Licensing Corporation.



Harman Kardon TD420

Cassette Deck Controls and Displays



Controls and Displays

1. Power Switch

Press to turn unit on/off

2. Record/Pause

Puts cassette deck in Record ready or pause mode.

3. Play

Begins playback or recording.

4. Stop

Stops tape transport in any mode.

5. Rewind/Fast Forward

Rapidly rewinds/advances tape.

6. Record Mute

Inserts blank space when recording.

7. Intro Scan

Previews each segment on a pre-recorded tape.

8. Search Foreward and Reverse

Locates the start of any desired segment on a pre-recorded tape. (See page #5)

9. Doiby NR

Activates Dolby Noise Reduction circuitry for playing or recording tapes.

10. B/C

Selects Dolby B or Dolby C Noise Reduction.

11. MPX Filter

Press when recording FM stereo broadcasts using Dolby noise reduction.

12. Bias Fine Trim

Adjust when recording. (See page #6)

13. Balance

Adjusts balance between left and right channels when recording.

14. Record Level

Adjusts recording level.

15. Open/Close

Press to load/remove tape cassette.

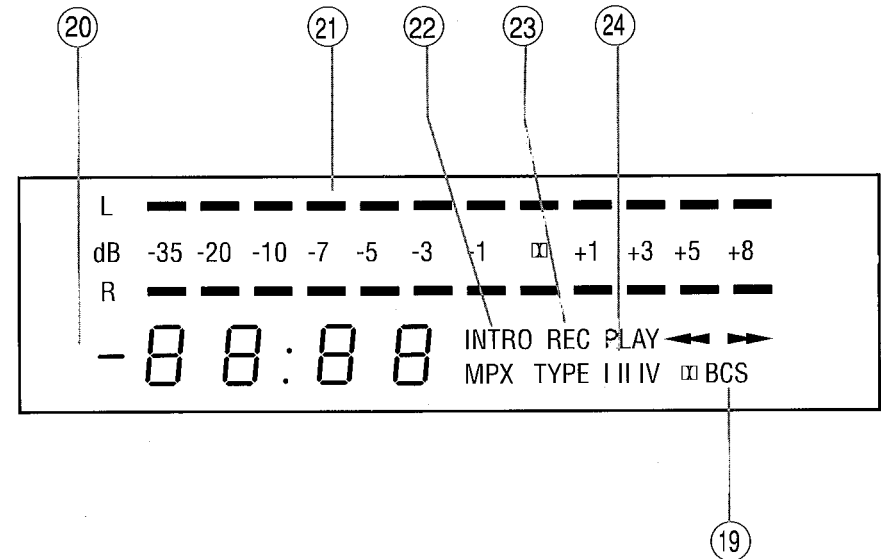
16. Cassette Compartment/Drawer

17. Counter Reset

Resets Tape Counter to 00:00.

18. CD Sync

Engage when synchronizing recording with a Harman Kardon CD Player.



19. B C

Shows if Dolby B or C circuits are on.

20. Counter

Indicates tape position in minutes and seconds.

21. Level

Shows signal level.

22. Intro

Indicates Intro Scan is engaged.

23. REC, PLAY,

Displays operating mode: Record, Play, Rewind or Fast Forward.

24. TYPE I II IV

Automatically indicates type of tape in use.

Operating Instructions

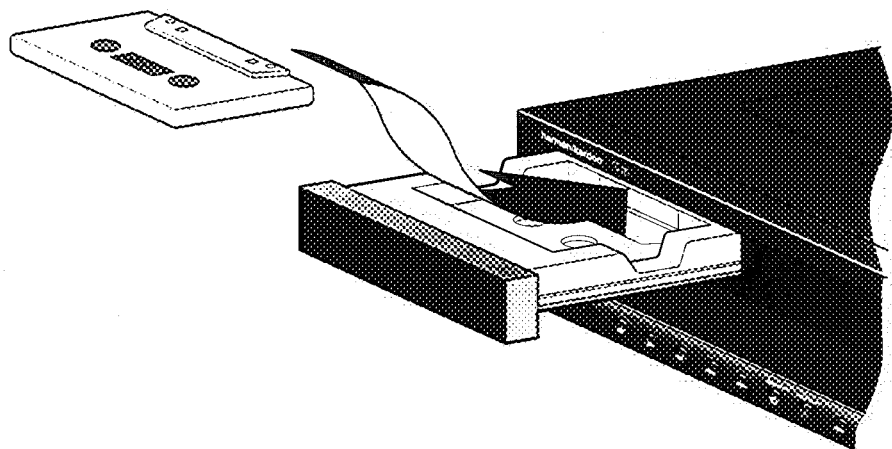
Inserting a Tape

1. Check cassette tape for excessive slack. If necessary, insert a pencil into one of the cassette hubs and rotate to take up the slack.
2. Press Open/Close.
3. Insert cassette, tape side toward rear of unit, and close compartment door.

NOTE: The cassette deck determines the type of tape in use and sets Bias/Equalization circuitry automatically.

Playing a Tape

1. If tape was recorded with Dolby Noise Reduction, press Dolby NR button. DD and "B" or "C" will appear on the display panel. Choose B or C by pressing the B/C button.
2. Press ► to begin play.



Previewing a Tape

1. Press Intro Scan. Cassette deck locates the beginning of recorded material and plays for 15 seconds. Tape is then advanced to the beginning of each successive recorded segment, or track, playing for 15 seconds before automatically advancing to the next track.
2. To stop Intro Scan, press ■. Or, press ► during any 15-second play segment, and tape will continue to play.

Locating Places on a Tape

1. To move quickly to the beginning of any desired selection, use the Search Reverse and Search Forward buttons (◀◀ and ▶▶ at lower left corner of the deck).

To skip to the beginning of the previous track, press ◀◀ again quickly before the present track begins playing.

2. Use the Counter. The Linear Time Counter indicates approximate tape position in minutes and seconds. Press Counter Reset at the start of a cassette to identify any desired point on the tape. (Elapsed time is maintained in Fast Forward and Rewind.) When counter is reset to 00:00 at the beginning of a

cassette, the approximate time remaining can be determined by subtracting the counter reading from the total tape time. The Linear Timer Counter accuracy is typically within 1 minute of the tape's actual running time.

Recording a Tape

1. Bias Fine Trim knob to middle position or to previously determined proper position for the tape (refer to following section for details).

2. Press the Dolby NR button to turn Dolby NR circuitry on/off, and press B/C button to select Dolby B or C as follows:

A. To record a tape without Dolby Noise Reduction, turn the Dolby NR switch off.

B. To record a tape with Dolby Noise Reduction, turn the Dolby NR switch on, and select Dolby B or C NR with the B/C switch.

C. When recording with Dolby Noise Reduction, consider the equipment on which you will play your tape. If playback equipment is not equipped for Dolby NR, turn the Dolby NR switch Off. If it is equipped for Dolby NR, turn the Dolby NR switch On; then select B if playback device is equipped only for Dolby B NR; otherwise select C.

3. If you are recording an FM stereo broadcast using Dolby B or CNR, turn on MPX Filter. Otherwise turn the MPX Filter Off.
4. Press ●. ("REC" will flash on and off on display panel.)
5. Play one of the louder segments of the material to be recorded.
6. Check the signal levels indicated by the bars marked L and R on the display. If levels are constantly unequal, turn the Balance knob left or right to correct the imbalance.
7. Check the Display Panel to determine the tape Type (I, II or IV), and set Input Level accordingly:
 - a. For Types I and II, the loudest material should illuminate the colored bars at +1 or +3dB;
 - b. For type IV, the loudest material should illuminate the bars at +3 or +5dB.
8. Return to the beginning of the material to be recorded.
9. Press ► to begin recording. (REC will be continuously displayed.)
10. At end of material to be recorded:

- a. Press ■ (Stop); or
- b. Press Rec Mute. This records 4 seconds of silence on the tape and returns the deck to Record. Press ● to continue recording.

Setting Bias Fine Trim

Bias Fine trim enables you to get optimal wideband recordings by adjusting the bias setting for the specific tape you are using.

You locate the correct setting by making a test recording, with the Bias Fine trim knob in different positions, as follows:

1. Turn Dolby NR off.
2. Start with Bias Fine Trim knob at extreme counter-clockwise position.
3. Choose a sound source (CD player, tuner or turntable) and set the Source Selector on your receiver/pre-amp/integrated amplifier accordingly.
4. Play the source material.
5. Load the cassette you are using into the deck, and press ► to advance partway onto the tape.
6. Press ■ (Stop) and then ● (Record/Pause).

7. Set the Input Level knob so that the signal level meter indicates -3dB.

8. Press Counter Reset.

9. Press ► to begin recording.

10. When the tape counter reaches 00:10, immediately turn the Bias Fine Trim knob clockwise by 1/8 turn.

11. When the tape counter reaches 00:20, again turn the knob clockwise again by the same amount.

12. Continue turning the knob by the same amount at 10-second intervals until the extreme clockwise position is reached.

13. Press ■ (Stop) and rewind the tape to 00:00 on the Counter.

14. Select Tape Monitor on your receiver/pre-amp/integrated amplifier. Turn up the volume to a high level (or use headphones).

15. Press ►.

16. Compare the sound on the tape to the sound from the original source by pressing the Tape Monitor switch on your receiver/pre-amp/integrated amp in and out. Find the place on the tape

where the sound is most similar to the original sound.

17. Note the reading on the Tape Counter. This will tell you which Bias Fine Trim setting produces the best sound for the tape you are using.

18. Make a note of the correct setting for this brand and formulation of tape. To find the ideal setting for other tape brands of formulations, repeat this test.

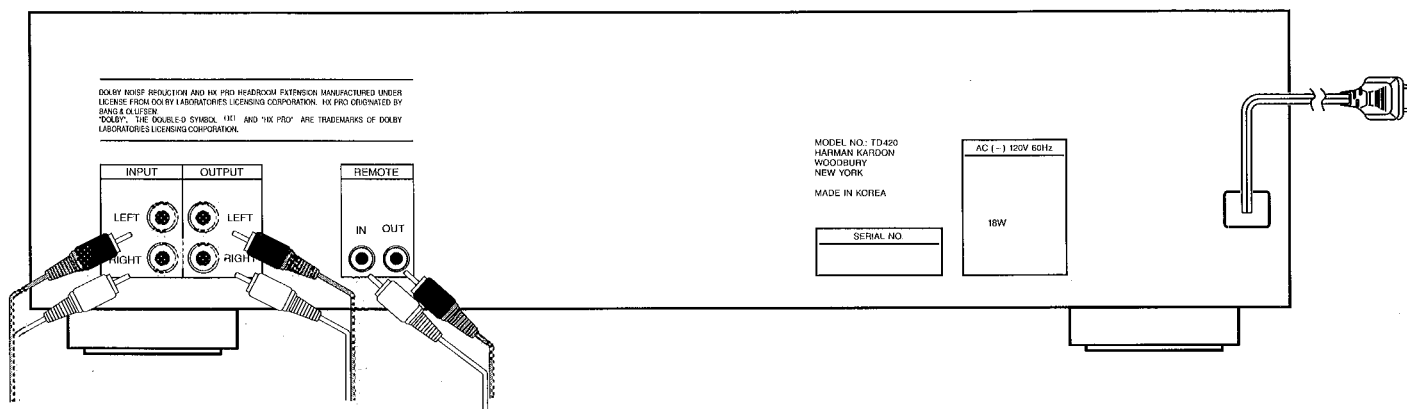
Recording Using the CD Sync Feature

To use the CD Sync feature first be sure that the TD 420 is correctly connected through its rear panel remote out jacks to the remote in jacks on a Harman Kardon CD player (refer to page 7).

Once connected, the cassette deck will control the PLAY, PAUSE, and STOP functions of your Harman Kardon CD player. To activate the CD Sync function press the CD Sync button on the front panel of the TD 420. The green LED will illuminate.

NOTE: Anytime the STOP button on the cassette deck is pressed the Sync function will turn off automatically.

Installation



To Record an entire disc

First make sure that you have selected the CD input on your Pr-Amp, Amplifier or Receiver. Set record and bias levels (refer to Recording a Tape Pg. 5). Put the CD Player in the STOP mode. To begin recording push the CD Sync. button. The cassette deck will begin recording as the CD player begins to play the disc.

To Record a selected CD track or a pre-programmed sequence of tracks

Preset the track to be recorded or program the CD player as you normally would, and press the CD Sync button on the cassette deck.

NOTE: Pressing the PLAY, STOP, or PAUSE buttons on the CD player will have no effect on the operation of the cassette deck.

Rec/Pause:

When in the CD Sync Mode, the REC/PAUSE button on the cassette deck is pressed, the CD player will automatically pause. When the PLAY button on the cassette deck is subsequently pressed, the CD player will resume playing as the cassette deck resumes recording.

Stop:

When you are finished recording press the STOP button on the cassette deck. The CD player will also stop. Pressing the STOP button will also de-activate the CD Sync mode.

Packaging

Save all packing material. It is essential for shipping should you move

or in the event the unit ever needs repair.

Placement

Unit may be placed on top of or beneath other stereo components, so long as its placement meets the cooling requirements of the component beneath it.

Hook-up

1. Make sure all stereo components are turned off.
2. Use the cable provided to connect the left and right input jacks of the cassette deck to the "Tape Monitor Output" jacks (sometimes labeled "Record") of your pre-amplifier, integrated amplifier or receiver.

3. Connect the left and right Output jacks on the deck to the "Tape Input" jacks (often labeled "Play" or "Monitor") on your receiver/pre-amp/integrated amplifier.

NOTE: If you are using an equalizer and/or other external signal processing components, which are now connected to the Tape Monitor loop of your receiver/pre-amp/integrated amplifier, you have two choices:

- a. Connect the deck to the Tape Monitor loop provided on the last outboard component; or
- b. If your receiver/pre-amp/integrated amplifier has two Tape Monitor loops, you may connect the cassette deck to the unused loop. (In this case, the cassette deck will be unaffected by the external signal processing components.)

AC Power

Plug the cord into a polarized wall socket, polarized extension cord, or AC convenience outlet on another stereo component.

Remote Control

If you wish to control your deck with an external infrared remote control sensor, connect the wire from the remote sensor to your cassette deck's "Remote Input" jack. (A control wire may then be run from the deck's

"Remote Output" jack to the "Remote Input" of another stereo component.)

Alternatively, if you have a stereo component with a built-in infrared remote sensor and a "Remote Output" jack, it may be possible to connect this jack to the "Remote Input" jack of your cassette deck. Not all components are compatible, but it will not hurt to experiment.

Once your deck is connected, you will need a compatible remote control commander. One such commander is the remote control unit from Harman Kardon's TD450 cassette deck, available through Harman Kardon's Parts Department.

In addition, most Harman Kardon Receivers include a System Remote Control which will control the functions of the cassette deck.

CD Sync Connection

Connect the TD420 "Remote Out" jack to the "Remot In" jack on a Harman Kardon Cd Player.

Cleaning the Tape Heads

Tape heads must be cleaned periodically to remove tape particles, which gradually build up on the heads, impairing sound quality and increasing wear on tapes. Heads may be cleaned in either of two ways:

1. Slightly dampen a cotton swab in isopropyl alcohol and gently rub the surfaces of each tape head. Use a second dampened swab to clean other surfaces coated with tape material. Repeat this cleaning every 30 tapes. The TD420 is equipped with an access hole on the top of the unit to facilitate cleaning of the heads. Be careful not to lose the cover to this access hole.

2. Use a tape head cleaning kit, which comes in the form of a tape

cassette, and is simply inserted into the deck. Follow the instructions included with the kit.

Demagnetization

Tape heads and other internal parts gradually pick up magnetic fields, which can add noise to your tapes and even partially erase them. To prevent this problem, tape heads should be periodically demagnetized.

A battery-powered demagnetizer is easiest to use. It comes in the form of a tape cassette and is simply inserted into the deck. Be certain to use this

demagnetizer as frequently as its instructions recommend.

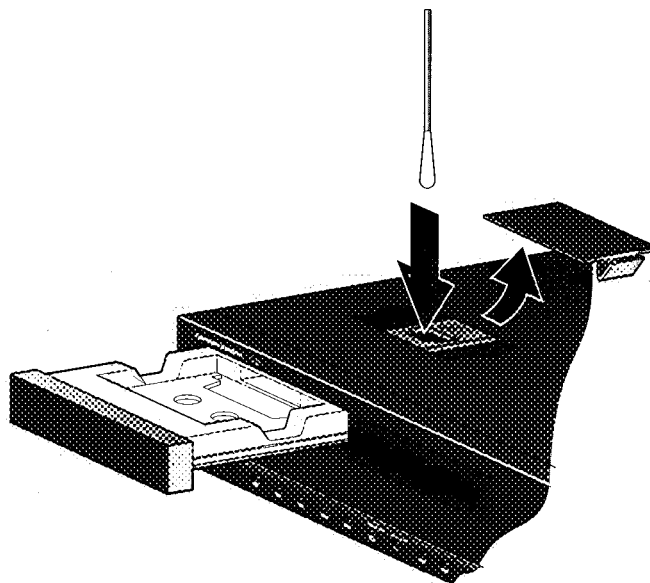
Care of Tape

1. Store cassettes in their cases, in a location away from direct sunlight, excessive heat and high humidity.

2. Avoid placing a tape near a television set or loudspeaker; their magnetic fields can partially erase the tape.

3. To prevent accidental erasure of a tape, use a small screwdriver to remove the two square tabs located on the side of the cassette opposite the exposed tape. With these tabs removed, the tape cannot be recorded. If you later wish to record an erasure-protected tape, simply cover the small holes with adhesive tape.

4. Do not use old cassettes whose tape no longer moves smoothly from reel to reel. They may jam and damage your deck.



Troubleshooting

This unit is designed for trouble-free operation; most problems users encounter are due to operating errors. So if you have a problem, first check the chart below for a possible solution. If the problem persists, consult your authorized Harman Kardon service center.

If the Problem Is:

The Display Panel does not illuminate when the Power switch is pressed.

No sound is heard when Play is pressed

The cassette deck does not record.

When a tape you have recorded is played back, the sound is distorted.

When a tape you have recorded is played back, the sound is muffled, with reduced high frequencies.

The CD Sync feature does not activate the CD player.

Make Sure That:

☐ The power cord is plugged in securely.

☐ The outlet is live.

☐ The tape is not at its end.

☐ The tape is not blank.

(Level indicators on the Display panel will flash if sound is recorded on the tape.)

☐ The receiver/pre-amp/integrated amplifier is on, and its Source, Tape Monitor, and Speaker switches are set correctly.

☐ The tape deck is connected properly.

☐ The hookup wires are unbroken.

☐ The erase-prevention tabs have not been removed from the tape cassette.

☐ The Input Level knob is set high enough.

☐ The tape deck is connected properly.

☐ The hook-up cables are unbroken.

☐ The Input Level was not set too high during recording.

A Dolby NR-encoded source tape was copied with the Dolby NR and B/C properly set.

☐ The tape is not worn out.

☐ The tape head is not dirty or magnetized (see Page #8).

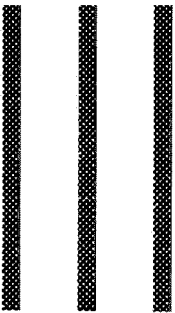
☐ The Dolby Noise Reduction switches were set incorrectly during recording.

☐ The tape head is not dirty or magnetized (see Page #8).

☐ A Harman Kardon CD player is being used.

☐ The remote cable is connected between the TD420 and the CD player.





Specifications

	TD420
Tape Speed (i.p.s.):	1-7/8
Heads:	2
Record/Play Head Type:	Hard Permalloy
Frequency Response, -20dB (IHF std):	20Hz-20kHz +/-3dB w/metal tape
Typical Large Signal Response (0dB):	20Hz-18kHz +/-3dB w/Dolby C NR & metal tape
Wow-and-Flutter:	
NAB, WRMS:	0.05%
DIN:	0.08%
Signal-to-Noise Ratio (Type II Tape):	
Dolby NR off:	57dB
Dolby B NR on:	65dB
Dolby C NR on:	73dB
Total Harmonic Distortion	
1kHz, metal tape, Dolby level:	1.0%
Channel Separation:	45dB
Channel Crosstalk:	70dB
Erase Ratio:	60dB
Bias Frequency:	105kHz
Fast Forward and Rewind Time:	90 sec (C-60)
Peak Reading Meter Range:	-35dB to +8dB
Output Level, 0dB, 10k Ohm load:	640mV
Input Sensitivity (0dB) Line:	45mV
Input Impedance Line:	22k Ohms
Dimensions (w x h x d):	17-3/8" x 5" x 12-5/8" 442mm x 126mm x 320mm
Weight:	11.9 lbs./5.4 kg